

Butler's Gartersnake Conservation Strategy

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Wisconsin Department of Natural Resources

Bureau of Endangered Resources
Department of Natural Resources
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Introduction

The Butler's Gartersnake Conservation Strategy was developed by the Wisconsin Department of Natural Resources (DNR) in partnership with a team of specialists with expertise in Butler's gartersnake biology, landscape ecology and ecological planning. The strategy was developed over a 16-month period that involved evaluating the snake's biology and life history, analyzing known and potential BGS sites, evaluating population viability needs, conducting field surveys, and gathering feedback and comments from stakeholders. Each of these steps are outlined below. A preliminary plan was presented in March of 2004 to a group of stakeholders, including planners, county governments, land trusts and developers to obtain their feedback on the strategy. A draft strategy was developed and refined by the DNR over the summer and fall of 2004 and again presented to the Stakeholders group in October of 2004. This strategy is a result of these efforts and remains a work in progress.

Background

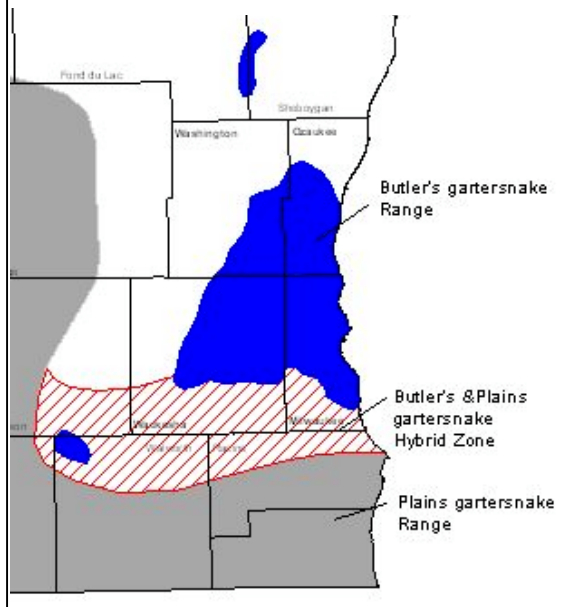


The state-threatened Butler's garter snake is the smallest of the five Wisconsin garter snake species. Both sexes of this species reach maturity during their second full year and females deliver 4-19 live-born young in mid to late summer. This species requires a moderately open to open canopy habitat, preferably with both upland and wetland habitat. Butler's naturally hibernate in open-canopy wetlands (sedge meadows, fringes of cattail marshes, etc.) but are also known to occupy sites that provide other means for successful overwintering (i.e. old landfills where conditions provide access below the frostline and where adequate moisture exists).

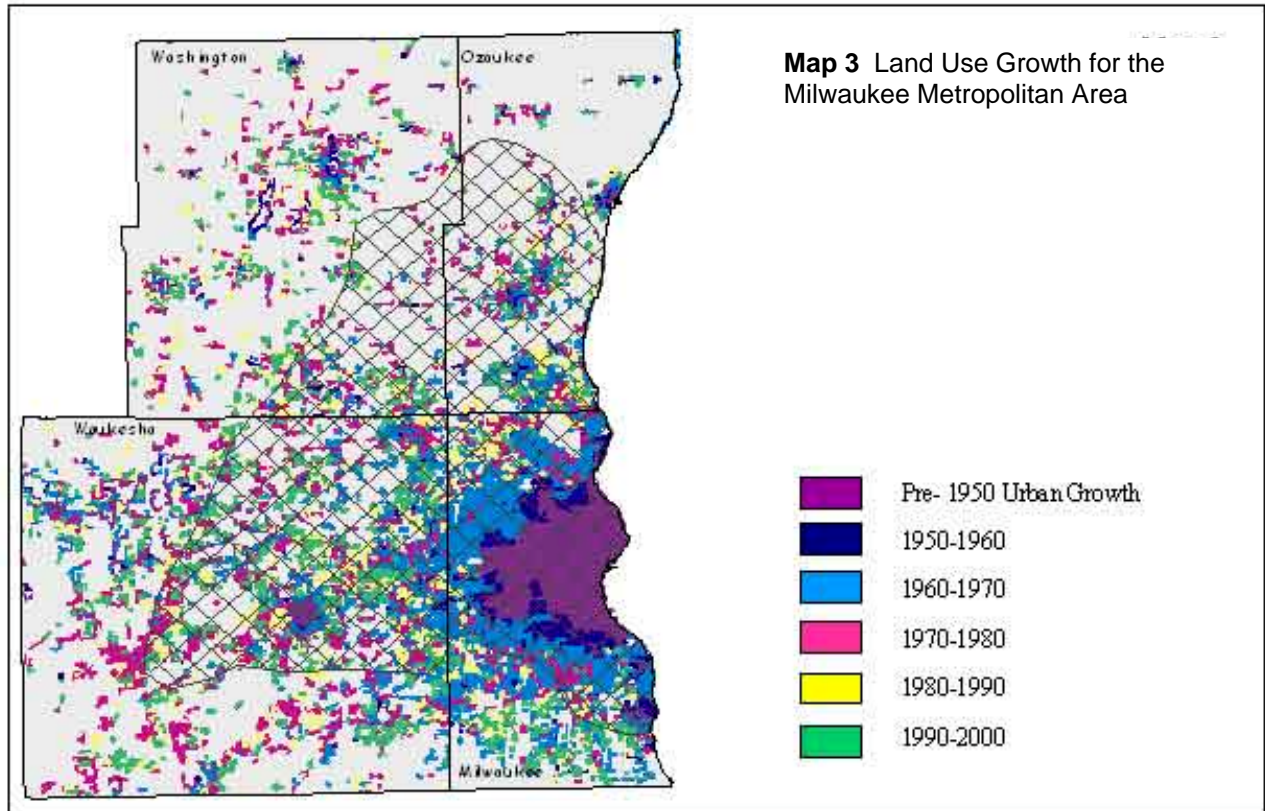
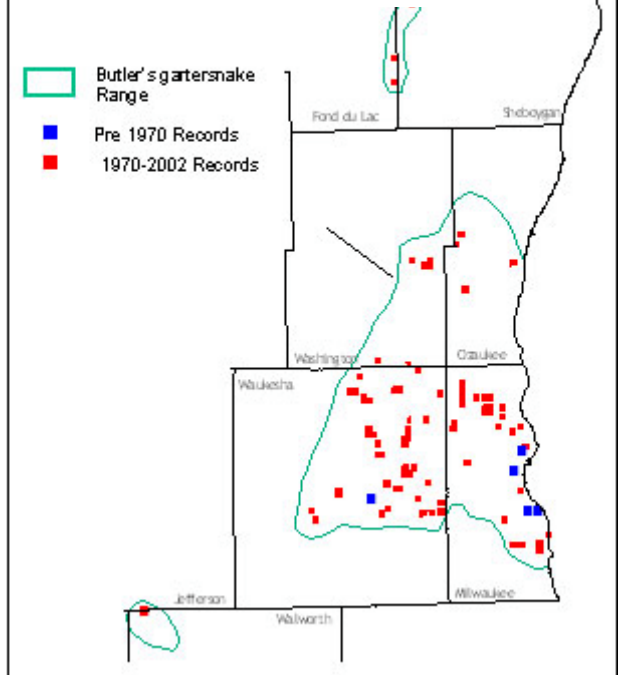
The range of the Butler's gartersnake in this state is limited to the greater Milwaukee area including most of Milwaukee County, the southern half of Ozaukee County, the southeastern quarter of Washington County and the eastern half of Waukesha County (see Map 1 and 2.). There are approximately 30 locations where this species has been documented from 1973 to present. Twenty-five of these records have been documented since 1990. Most sites that have been moderately to heavily surveyed for Butler's show a healthy age-class structure, indicating that regular recruitment is occurring on those sites. Surveys and monitoring since its listing in 1997 reveal that Butler's often occur in very large numbers on relatively small sites (i.e. 400+ snakes detected on a 20-acre site with less than 50% suitable [open canopy] habitat). Three intensive survey/monitoring efforts associated with mitigation for incidental take to date have involved large numbers of Butler's garter snakes (over 1200 Butler's on three isolated sites along Lincoln Creek within the City of Milwaukee). Surveys have also demonstrated that Butler's can occur, sometimes in high numbers, on highly disturbed and degraded sites.

The Wisconsin population is disjunct from other Butler's gartersnake populations located in Indiana, where it is listed as an Endangered species and in northwestern Ohio and southeastern Michigan where it is apparently secure. Southern Ontario also has a small population where the species is listed as Threatened. The Wisconsin Department of Natural Resources listed this snake as a Threatened species in 1997. The two primary reasons for its listing were the loss and fragmentation of suitable habitat and hybridization with the eastern plains gartersnake (*Thamnophis radix*) along the southern boundary where the ranges overlap. Milwaukee County has lost significant amounts of suitable snake habitat since 1950 and many of the sites that supported historical occurrences (pre-1970) for this snake have been lost to development. Data accumulated by the Southeastern Wisconsin Regional Planning Commission clearly demonstrate that habitat loss due to urban development is occurring at an accelerated rate (see Map 3).

Map 1 Butler's Gartersnake Range



Map 2 Distribution of Known Occurrences



Definitions

The following habitat definitions are important to understand the habitat requirements of the Butler's gartersnake and to appropriately implement the Conservation Strategy.

Suitable Habitat Patch:

This is defined as undeveloped areas that include both wetland and adjacent upland habitat. The patch is not based on a project's site but the area of contiguous suitable snake habitat. To be considered as potential Butler's Gartersnake habitat:

- The wetland habitat may be any classification except permanent open water. Lakes, streams, and deep ponds are not considered suitable, nor are permanent stormwater management ponds. A 100' edge of forested wetland where it abuts or is adjacent to suitable upland habitat is also considered suitable, as crayfish burrows are likely to be present in this habitat.
- The upland habitat must be within 300 feet of over-wintering wetlands AND have intact ground vegetation (grasses, forbs) AND have less than 75% canopy closure. The upland habitat must be directly connected to the wetland in at least one location. Closed canopy forests where ground vegetation is very sparse are not considered suitable, but old fields with significant invasion of woody shrubs and trees is suitable if grasses and forbs are still largely intact. Lawns and fields in active agriculture row crops or in crop rotation are not considered suitable. Fields that remain fallow for more than one year may be considered suitable habitat. Pastures will be included as suitable habitat if more than 50 percent of the acreage had an eight-inch or greater canopy height.

Suitable Habitat Size:

The habitat patch size assumes that as size increases the potential for snakes to persist increases because larger sites tend to be better buffered against localized effects and have the potential to support larger Butler's populations. Larger sites tend to also support a greater diversity of microhabitats that afford better buffering against wholesale invasions of exotic plant species. Exotic plants, like reed canary grass, often grow in dense stands that prevent crayfish from burrowing. Crayfish burrows provide essential overwintering habitats for Butler's gartersnake. Increased patch size often provides more snake-friendly edge habitat between uplands and wetlands. Edges appear to be especially important for Butler's gartersnakes.

Suitable Habitat Quality:

Poor: Habitat is considered to be *poor quality* if more than 75% of the wetland habitat component is dominated by dense cattail (*Typha* sp.) beds or dense stands of exotic species (i.e. reed canary grass, *Phalaris arundinacea*; purple loosestrife, *Lythrum salicaria*; giant reed grass, *Phragmites* sp.); and/or more than 75% of the ground cover (grasses and forbs) in the upland habitat component is relatively sparse and likely to become sparser through ongoing natural succession.

Moderate: Habitat is considered to be *moderate quality* if 50-75% of the wetland habitat component is dominated by dense cattail (*Typha* sp.) beds or dense stands of exotic species (i.e. reed canary grass, *Phalaris arundinacea*; purple loosestrife, *Lythrum salicaria*; giant reed grass, *Phragmites* sp.); and/or 50-75% of the ground cover (grasses and forbs) in the upland habitat component is relatively sparse and likely to become sparser through ongoing natural succession.

Good: Habitat is considered to be *good quality* if less than 50% of the wetland habitat component is dominated by dense cattail (*Typha* sp.) beds or dense stands of exotic species (i.e. reed canary grass,

Phalaris arundinacea; purple loosestrife, *Lythrum salicaria*; giant reed grass, *Phragmites* sp.); and/or less than 50% of the ground cover (grasses and forbs) in the upland habitat component is relatively sparse and likely to become sparser through ongoing natural succession.

Isolated:

A site that does not exchange genetic material with other sites, due to being physically separated from other suitable habitat patches. Barriers may include *impassable physical structures* (paved roads, parking lots, walls), or *resistant terrain* (mowed lawns, golf courses, forests, agriculture). *Resistant terrain* is land use that a snake could still physically pass through, but would do so only occasionally, with risk of predation, desiccation, and lack of shelter from the elements. Where *resistant terrain* connects suitable habitat patches, *resistant terrain* of over 1000 feet should be considered an impassable barrier.

Temporary Habitat Disturbance:

Defined as a disturbance of Butler's gartersnake habitat that will be restored to its pre-activity condition or a condition that improves habitat for the Butler's gartersnake following completion of the activity.

Goal and Objectives of the Butler's Gartersnake Conservation Strategy

The goal of the Conservation Strategy is *to secure the long-term protection of the Butler's gartersnake*. The Strategy has been developed and will continue to be implemented through the following objectives:

Strategy Objectives

1. Increase our understanding of the life history and habitat needs of the Butler's gartersnake, including a better definition of the snake's range within Wisconsin.
 - a. Conduct genetic analysis to separate pure Butler's from hybrids.
 - Secured funding and initiated the genetics analysis for the Butler's gartersnake population in Wisconsin. Final results are expected in Fall of 2005.
 - b. Survey additional areas with potentially significant long-term conservation value to determine snake presence/absence, assess general population health and evaluate habitat quality (ongoing annually as funding permits).
 - Secured funding for fieldwork and site analysis for the 2004 and 2005 field seasons.
 - c. Conduct a population viability workshop to determine the number of significant long-term conservation sites that are needed to secure the long-term protection of the Butler's gartersnake.
 - Completed population viability workshop. Result indicates that 65 sites with significant long-term conservation value need protection in order to insure the long-term protection of the Butler's Gartersnake, based on current knowledge. We will review this number when the genetics study is completed.
2. Develop a Conservation Strategy that includes a classification system to assess existing or potential Butler's gartersnake habitat throughout the snake's range and establishes long-term conservation priorities for the snake.
 - a. Establish classification criteria and classify known or suitable habitat patches throughout the range (see **Figure 1**).
 - Developed site classification key that consists of a 3-tiered system based on site size and habitat quality.
 - Develop and implement broad incidental take authorization of conservation sites based on the classification for private and public sites.
 - b. Conduct GIS analysis of sites within the Butler's gartersnake range to determine the patch size and habitat quality.
 - Completed initial GIS analysis that identifies potential sites of significant long-term conservation value (Tier 3 sites). Continue to assess and classify new sites through DNR fieldwork and the environmental review process.
 - c. Implement the classification system by focussing efforts on sites with greatest conservation value.
 - Completed Broad Incidental Take Authorization for sites containing habitat of minimal conservation value (Tier 1 sites) and for sites that result in a temporary take of habitat.
 - Broad Incidental Take Authorization for sites containing habitat of moderate conservation value (Tier 2 sites) is pending. The Department has scheduled a briefing of the Natural Resources Board on this and other issues related to the Butler's.

3. Develop conservation measures that can be used to protect snakes and manage for and enhance suitable habitat.
 - a. Develop specific conservation measures to protect the Butler's gartersnake and to manage or enhance suitable habitat.
 - Developed required and voluntary Conservation Measures applicable for all of the tiers (see attached Figure 1 and Appendix A-Voluntary Activities). Continue to require or recommend measures as appropriate.
 - b. Promote snake-friendly habitat conservation and management into the site design for development projects.
 - Developed habitat management guidelines to assist land managers, site planners and consultants to develop management plans and site designs that benefit the Butler's gartersnake and other wildlife (see attached **Management Guidance for Butler's gartersnake**).
4. Secure the support of the Conservation Strategy by the various stakeholders, including the conservation, development and research communities.
 - a. Establish conservation agreements with public land management agencies that own and manage significant long-term conservation sites. Develop long-term habitat management plans for these sites to preserve habitat quality and protect Butler's gartersnake populations.
 - Coordinating with Milwaukee and Waukesha Counties concerning cooperative snake conservation including permission to access their properties and preliminary agreements to cooperate on the development of long-term habitat management plans for their properties. A meeting with public land managers throughout the snake's range was held in early March 2005.
 - b. Educate consultants and developers regarding how to design conservation into their projects to maximize values for the snake and other wildlife.
 - Conducted training workshop with Metropolitan Builders Association to inform developers and consultants of the new conservation strategy, how it affects them and how they can assist the conservation of the snake.
 - c. Work with non-government conservation organizations to acquire and manage sites with long-term conservation value.
 - Met with representatives of the conservation groups within the snake's range to discuss conservation opportunities. Currently working with these groups to develop conservation priorities and establish contacts with landowners.
 - d. Work with private landowners that are interested in managing their lands to benefit the Butler's gartersnake.
 - Began a landowner contact program for owners of private lands with significant long-term conservation potential. The initial step involves getting permission to conduct Butler's presence/absence surveys and obtain initial population data
 - e. Work with local units of government and SEWRPC to conserve habitats along environmental corridors with significant long-term conservation value for Butler's gartersnakes.
 - Met with SEWRPC and local government representatives to discuss other alternatives to protection Tier 3 sites.

Butler's Gartersnake Site Classification

The primary component of the strategy is the Classification System that categorizes into three tiers sites that support, or have the potential to support, the snake. Each tier represents the potential long-term conservation value of a particular site for the Butler's gartersnake. Each suitable habitat patch is evaluated by two primary factors, suitable habitat size and habitat quality (see definitions). The application of these two factors provides a scientifically sound framework for setting protection and management priorities directed at the long-term survival of this species.

To develop this system, the Department reviewed the most current scientific research for the Butler's gartersnake and conducted a generalized GIS analysis of potential suitable habitat within the snake's range. Aerial photography and land covers were reviewed to identify suitable snake habitat for each county. This effort was undertaken to identify and delineate the number and size of the larger habitat patches that appear to have significant long-term conservation value for the snake. From this analysis, the Department was then able to quantify habitat patches into size categories. Habitat quality criteria were developed to give value to the various habitat conditions present among sites. This combination provided the framework and justification for the three-tiered system found in Figure 1.

In August 2004, the Bureau of Endangered Resources conducted a formal workshop to determine, based on current data, how many populations would be needed to secure the species in the long term. The criteria used in making these assessments was developed by The Nature Conservancy's National Office and is used worldwide as a standard for programs that employ the Natural Heritage methodology. The workshop included department and external experts, with expertise ranging from herpetology to conservation biology and population ecology. The result of this science-based process indicates that 65 viable populations must be protected to insure the long-term protection of the Butler's Gartersnake. This finding is based on:

- Identified factors that affect the number of populations that are needed
- Assumptions associated with these factors
- Uncertainties associated with these factors.

Current analysis of suitable habitat within the snake's range indicates that there are a sufficient number of sites to reach the target of 65 Tier 3 sites. This number will be reviewed upon completion of the genetics study and we will continue to assess significant sites to determine snake presence and population health. These results will help guide the development of this dynamic conservation strategy.

The Department will classify a site by evaluating the entire suitable habitat patch. The acreage calculation is not limited to a project site – rather it includes the total contiguous suitable habitat within and beyond the project site (see definitions).

Conservation Measures

Conservation measures have been developed for each of the tiers and are detailed in Figure 1 and summarized below. Voluntary conservation measures are also described and recommended for projects where developers are interested in increasing protections beyond the required guidelines (see Appendix A).

Sites classified as Tier 1 are covered under a broad incidental take authorization that was completed in October 2004. Under this revised conservation strategy, the Department proposes the same broad authorization for Tier 2 sites assuming that the conservation of Tier 3 sites can be achieved. The

Department will evaluate projects that involve a Tier 3 site on a case by case basis to implement the conditions of the strategy and determine the need of incidental take authorization.

The following conservation measures are required to ensure the long-term conservation of the Butler's gartersnake and provide flexibility in the regulatory requirements of the Wisconsin Endangered Species Law pertaining to the snake:

I. Projects that Result Only in Temporary Habitat Disturbance

Broad incidental take authorization was finalized by the Department in August 2004 for projects that result only in the temporary disturbance of Butler's habitat. The authorization requires that the disturbed Butler's gartersnake habitat be restored to its pre-activity condition or a condition that improves habitat for the Butler's gartersnake following completion of the activity. See the final authorization at <http://dnr.wi.gov/org/land/er/take/TempHab.htm>.

Requirements:

1. A letter from the Department is required to be covered under the Temporary Habitat Disturbance Broad Incidental Take Authorization.

II. Tier 1 – Sites of Minimal Long-term Conservation Value

The Department, with advice from the Butler's Conservation Team, determined that Tier 1 sites do not contribute to the overall conservation of the species because their habitat is either isolated from other patches, too small or of poor quality. The loss of individuals at Tier 1 sites is not expected to have a negative effect on the overall status and recovery of the species because they do not offer long-term conservation value for the snake. As a result, the Department authorized broad incidental take authorization in October 2004. No conservation measures are required for projects covered under this authorization but voluntary actions are recommended. See the final authorization at <http://dnr.wi.gov/org/land/er/take/TierOneButlers.htm>.

Requirements:

1. See Summary of Conservation Measures in Figure 1.
2. A letter from the Department is required for coverage under the Tier 1 Broad Incidental Take Authorization. See Project Review Process below.

II. Tier 2 – Sites of Moderate Long-term Conservation Value

Figure 1 lists conservation measures for Tier 2 sites that will be required through individual incidental take authorizations. However, the conservation strategy proposes broad incidental take authorization of Tier 2 sites, identical to that for Tier 1 sites, assuming the conservation of a sufficient number of Tier 3 sites can be secured with no-net-loss of suitable habitat at any individual site. The current measures will not be required upon authorization of the Tier 2 broad incidental take.

Requirements:

1. See Summary of Conservation Measures in Figure 1.
2. Individual Incidental Take authorization is required as described in Figure 1 until the broad incidental take authorization is finalized. See Project Review Process below.

Figure 1 Site Classification System and Conservation Measures

(This file is available at http://dnr.wi.gov/org/land/er/review/butler/Figure1_v2.3.pdf (PDF, 34KB). File needs to be printed on 11X17 paper, landscape orientation.)

III. Tier 3 – Sites of Significant Conservation Value-

Tier 3 sites potentially support large Butler's gartersnakes populations and are critical to the long-term conservation of this animal. The loss of a population at a Tier 3 site would jeopardize the status of the species based on the current data available. The Conservation Strategy calls for take to be avoided at these sites, except in the case of habitat management. If take is proposed outside of that necessary for habitat management, project-specific incidental take authorization is required. For Tier 3 sites, all suitable habitat must either be maintained or the equivalent of any lost suitable habitat must be restored to suitable habitat elsewhere within the habitat patch so that there is no net loss. The department will evaluate all within-patch mitigation plans as appropriate.

- A. **Public Significant Conservation Sites** - Publicly owned Tier 3 sites currently have the greatest potential to serve as long-term conservation sites. These have sufficient habitat or the potential to support sufficient habitat to preserve the snake in perpetuity. The Department will pursue conservation agreements for all publicly owned Tier 3 sites and will assist in developing site-specific habitat management plans as appropriate. Within each plan, all allowances for incidental take of Butler's will be identified. These plans will include agreed upon detailed snake and snake habitat conservation measures to be implemented to help insure the long-term viability of the snake on these sites. See the management guidance section for snake-appropriate management actions.
- B. **Private Significant Conservation Sites** - Privately owned Tier 3 sites have the potential to serve as long-term conservation sites and are important to efforts to secure the 65 sites needed for long term conservation. The future of private sites is uncertain because of multiple private ownerships and increasing development pressure. Projects impacting all or a portion of these sites will be required to avoid or minimize incidental take according to the conservation measures in Figure 1. These sites may or may not be connected to publicly owned significant conservation sites.

If incidental take cannot be avoided, then incidental take authorization is required on a project by project basis. The Department must reach a determination that the incidental taking will not jeopardize the species before authorizing the take. A conservation plan will likely be required.

Endangered Resources Review Process for Potential Development Projects

The Department evaluates each proposed project to determine which of the three conservation tiers their site is within and recommends or requires appropriate conservation measures per the Strategy. In many cases, the classification system evaluates suitable habitat for the Butler's gartersnake because the presence or absence of the snake is not always known. Surveys can be conducted to confirm presence - however, the Department's methods for evaluating habitat are sufficiently reliable to confirm the potential presence of the snake. Project proponents are required to conduct surveys to confirm presence/absence for all Tier 3 sites to ensure that protected sites do have confirmed snake records.

Note: A site's conservation value can change as habitat quality and quantity improves or declines.

The evaluation of a site according to the Butler's Gartersnake Conservation Strategy occurs within existing DNR review processes to ensure appropriate consideration for potential impacts to all rare species and natural communities within the Natural Heritage Inventory (NHI) Database, including the Butler's gartersnake. The two processes highlighted here are specifically for the development community (residential and commercial development) within the Butler's range to ensure that project applicants have a clear understanding of how to proceed with proposed projects in light of the Conservation Strategy.

- I. All proposed development projects that require a DNR permit are screened for NHI issues by the regional permit staff as part of the permitting process. For example, projects that require a stormwater permit or water quality certification are reviewed by the appropriate permitting staff person. The Department staff person will work directly with the applicant to resolve any issues that arise regarding endangered resources. However, permits are sometimes applied for late in the planning/design process. In other cases, projects are not required to obtain a DNR permit.
- II. If state permits are not required for a project or a project applicant wishes to get an early reading on endangered resource issues (i.e. prior to permit application), they may submit projects directly to the Endangered Resources (ER) Program for review. This will allow rare species concerns, including Butler's gartersnake, to be incorporated into their plans efficiently and for the greatest benefit for the project proponent and the rare species. It also ensures the project proponent is consistent with state and federal laws. *A review request must be submitted to ER by the landowner(s) or with landowner(s) consent and carries a required fee.*

The ER Program's Environmental Review Process outlined below reviews existing NHI records for all rare species, including the Butler's gartersnake.

Endangered Resources Review Process

- 1) Applicant fills out Environmental Review Request Form - Form 1700-047 (<http://dnr.wi.gov/org/land/er/review/>) indicating location and nature of the project. The form should be accompanied by a wetland delineation report (if one has been done), digital photos that depict all existing site conditions, a preliminary development plan that depicts the construction footprint, and any other information that will assist staff in completing the review.
- 2) ER staff reviews the proposed project area and identifies any threatened, endangered, or special concern species or unique or sensitive natural communities that occur or could occur in the project area, including the Butler's gartersnake.

- 3) An ER Review letter is provided to the project proponent indicating if there are any rare resources that would be impacted by the proposed project and recommendations on how to proceed with regards to those resources. This letter addresses all rare resource concerns in the project area.
 - a. If there is potential for Butler's Gartersnake to occur in the project area, DNR staff will evaluate the site according to the Butler's Gartersnake Conservation Strategy and classify the site in one of three Tiers. Conservation Measures, including snake surveys to verify the presence or absence of snakes, will be required or recommended according to the Conservation Strategy. This determination will be based on known or likely occurrences and suitability of habitat in the project area. The results of the Conservation Strategy determination are included within the review letter from ER. *The letter should be provided as part of any subsequent permit application so DNR Southeast Region permit staff know an ER review has already been completed.*
 - b. If snake surveys are conducted, permission from the landowner(s) is required in writing prior to surveys being conducted.
 - c. DNR Staff will continue to work with the applicant to address Butler's Gartersnake issues or other endangered resource concerns as appropriate, including incidental take authorization if necessary.
- 4) The letter from ER only addresses endangered resource issues. It does not constitute Department of Natural Resources authorization of the project and does not exempt the applicant from securing necessary permits or additional approvals from the Department.

Appendices

Appendix A – Voluntary Actions for protecting Butler’s gartersnake Habitat

The following actions may be taken to avoid take of the snakes and provide protection for the species and their habitat.

Tier 1	Tier 2	Tier 3	Voluntary Protection Measures
✓			Install trenched-in silt fencing just outside the wetland boundary prior to Mar. 16 to prevent snakes from entering the project site once snakes emerge from hibernation. The fence will need to encompass the construction site on all sides up to 300 feet from any snake overwintering wetlands in order to avoid snake mortality. The fence should be installed with loop-arounds at the ends and at openings in order to redirect the snakes away from them (see Diagram 1). Fences should be maintained throughout the snake’s entire active period (Mar. 16 – Nov. 5).
✓	✓	✓	Time projects so that they occur during the snake’s inactive period (Nov. 6- Mar. 15).
✓	✓	✓	Redesign project to maximize remaining suitable habitat patch size. This can include building in natural green space, especially including unmanicured upland habitat adjacent to the natural wetlands, including the perimeters of stormwater management ponds.
✓	✓	✓	Redesign stormwater management ponds to be retention (hold water temporarily) rather than detention (permanent/semi-permanent) ponds where permissible.
✓	✓	✓	Support research that increases our knowledge of snake habitat requirements and management. This could include providing access to your properties by researchers or helping fund this research.
✓			Conduct periodic maintenance of the suitable upland habitat area, including either mowing, burning or brush/tree removal with glyphosate applications to cut stems during the snake’s inactive period to prevent the habitat from becoming unsuitable habitat (see definition of suitable upland habitat).
	✓	✓	Land Trusts or other conservation organizations obtain conservation easements to protect additional habitat.
	✓	✓	Establish voluntary protection agreements with private landowners.
	✓	✓	Establish upland habitats to further protect and/or maintain Butler’s habitat.
	✓	✓	Fee Title acquisition by DNR or other conservation organizations.

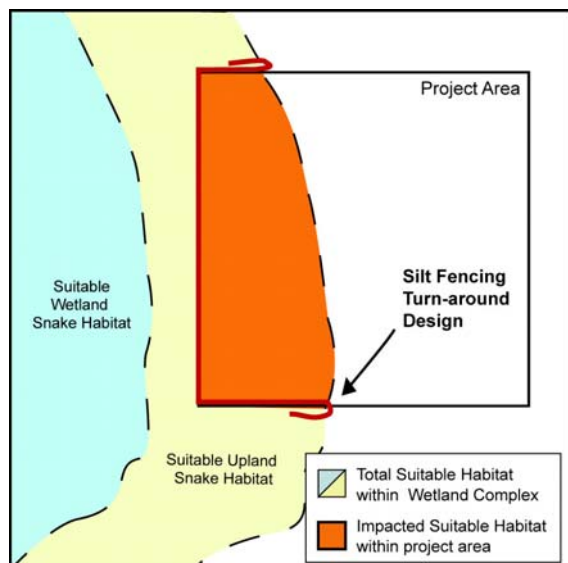
Appendix B – Snake Exclusion Fencing Design and Construction Requirements

Snake fencing must be installed prior to the initiation of construction per the requirements of each Tier described above. Snake fencing is standard silt fencing that is installed in the following manner:

- Snake fencing must be trenched in at least 4 inches and compacted to prevent snake from passing under the fence in any areas;
- Trenched in snake fencing must be installed with the fence stakes placed on the away from the wetland side of the fence (opposite the normal requirement for sediment control);
- The fencing must separate the entire authorized construction footprint from the surrounding snake habitat up to 300 feet from the wetland boundary. The fence should be installed with loop-arounds at the ends furthest from the wetland habitat and at any access openings needed in the fencing in order to redirect the snakes away from them (see Diagrams 1 and 2);
- Fences must be inspected at least twice weekly on non-consecutive days or after a significant rain event, which is a $\frac{3}{4}$ inch downpour or 1.5 inches of rain in any 24-hour period. Repairs must be made within 24 hours.
- These fences must be maintained through out the snake's entire active period (Mar. 16 – Nov. 5) or until all construction and landscaping activities have been completed, whichever occurs first. If the project continues into more seasons, fencing must be maintained during the snake's active season until project completion;
- Additional sediment control fencing may be required as part of other Department permit conditions.

*Note. If fencing cannot be installed by March 15, please contact the Bureau of Endangered Resources, as there may be some latitude with the installation date based on weather-related conditions in spring.

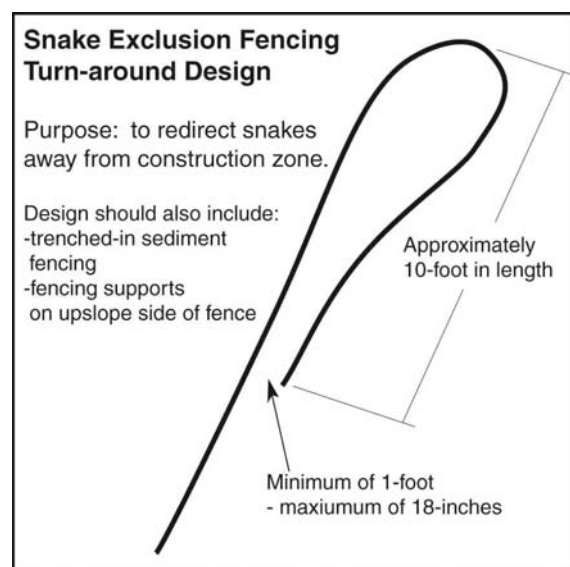
Diagram 1



**Snake Exclusion Fencing Diagram
for projects Impacting Upland Habitat
for the Butler's gartersnake**

2/17/2004

Diagram 2



**Turn-around Design
for Snake Exclusion Fencing
for the Butler's gartersnake**

2/28/2005

Appendix C – Moving Snakes- Methods and Requirements

Moving snakes involves capturing snakes that are living in suitable snake habitat within a construction footprint and moving them immediately outside of the snake exclusion fencing into adjacent suitable snake habitat, preferably toward the suitable wetlands. This work must be performed by qualified consultants that are familiar with Butler's gartersnake habitat requirements. Consultants who plan to conduct snake removals must obtain an Endangered and Threatened Species Permit prior to handling Butler's gartersnakes. Species identifications involving all gartersnakes found must be verified by a qualified herpetologist familiar with Butler's gartersnakes until the consultant doing the work has proven his or her ability to properly identify Butler's gartersnakes.

Moving snakes usually employs two methods:

1. Placing plywood boards to attract snakes - specific methods and timing are continually changing as we learn more through observation and research.
2. Funnel trapping along the construction side of the snake exclusion fencing- this method was recently tested on an experimental level but will be allowed. Methods and timing will continue to be modified as more of this work is conducted.

Projects have experienced significant increases in the time involved for snake removals where project proponents failed to maintain fence integrity and snakes return to the removal area. It is more cost effective and protective to maintain fences than to continue the snake removal process. Snake removals will be required until the Department is satisfied that the majority of snakes have been removed.

Consultants performing this work should check with the Department on the latest specific methods and timing requirements.

Appendix D – Management Guidance for Butler’s Gartersnake Habitat

Periodic maintenance of suitable upland habitat is required for Tiers 2 and 3 and is recommended for Tier 1. If the management activity is for the purpose of recovering, maintaining or improving the grassland, prairie or savanna ecosystem that includes habitat for Butler’s gartersnakes, then incidental take is allowed if the following protocols are followed. If incidental take of Butler’s gartersnakes results from the activity, please notify BER so we can reevaluate this guidance. Incidental Take Authorization for these activities is proposed for April 2004.

To maintain suitable habitat for the Butler’s gartersnake, partial mowing or burning of the suitable upland habitat should be conducted at least once every 3-5 years to suppress natural succession.

A. Burning:

1. If burning will be done between November 6 – March 15, there are no restrictions.
2. If burning will be done between March 16 – November 5, then only up to 25% of the available grassland habitat for that site (*see definition*) should be burned in any one year.

B. Mowing/Haying:

Herbaceous mowing and brush-mowing should be done as follows:

1. Conduct mowing in small patches in a monthly rotational pattern, with no more than 33% of the available grassland habitat on the site (*see definition*) affected in any one year.
2. Mower blades should be set a minimum of 8 inches off the ground.
3. Conduct when weather conditions are most likely to avoid snake activity:
 - 3.1 during the hottest period of the day when sunny conditions prevail and air temperatures exceed 80° F, OR
 - 3.2 on very cool, overcast days when temperatures are below 50° F

C. Selective Brush/Tree-Cutting:

Selective cutting (i.e. chain saw) may be done without restriction.

A. Grazing:

Light-to-moderate grazing (<1.0 head per acre) may be used in rotations among habitat patches, with no more than 33% of the available habitat on the site (*see definition*) grazed in any one year. Grazing should be discontinued in a patch as soon as 50% of the grasses and forbs in a grazed patch are cropped to 8 inches in height. For heavier grazing, contact Bob Hay in BER.

B. Herbiciding:

1. To the maximum extent possible, herbiciding should occur during the snake’s dormant period (Nov. 6- March 15).
2. Where active season (March 16 – November 5) herbiciding is necessary to control herbaceous vegetation, spot treat, preferably with a low persistence/short half-life herbicide (i.e. Round-up®), using wick, sponge or hand-held spray applications, not broadcast spraying. Basal-bark or cut-stump-treatment methods should be used when treating woody vegetation.